

THE GENUS *TYPOPSILOPA* CRESSON IN THE WESTERN HEMISPHERE
(DIPTERA: EPHYDRIDAE)

WILLIS W. WIRTH, *Systematic Entomology Laboratory,
Entomology Research Division, Agr. Res. Serv., USDA*¹

The genus *Typopsilopa* Cresson has only two recorded American species, *atra* (Loew), thought to range from Oregon to Ontario and south to California, Florida, and Central America, and *flavitarsis* Cresson, a Neotropical species ranging to Arizona and the southern states. Examination of the male genitalia of available specimens reveals that these species have been confused with each other, that two new North American species have been confused under *atra*, and that there are three new Neotropical species closely related to *flavitarsis*. The species are readily separated by examination of the male genitalia, but they are very difficult to recognize by using external characters. Cresson applied the name *Psilopa nigra* Williston to a species of *Helaeomyia*, but examination of Williston's type shows that it is a *Typopsilopa* and identical with *flavitarsis* Cresson, which falls as a synonym.

The types of the new species here described are in the U. S. National Museum (abbreviated USNM in this paper) in Washington, D.C., unless otherwise specified. I am greatly indebted to the following persons and institutions for the opportunity to study material in their respective museums and collections: Paul H. Arnaud, Jr., California Academy of Sciences, San Francisco, California (CAS); George W. Byers, University of Kansas, Lawrence (KANS); J. G. Chillcott, Canada Department of Agriculture, Ottawa, Canada (CAN); Saul Frommer, University of California, Riverside (Riverside); Harold J. Grant, Academy of Natural Sciences of Philadelphia, Pennsylvania (ANSP); R. O. Schuster, University of California, Davis (Davis); and Pedro W. Wygodzinsky, American Museum of Natural History (AMNH), New York, N. Y.

Genus *Typopsilopa* Cresson

Typopsilopa Cresson, 1916, Ent. News 27:147.—Cresson, 1947, Trans. Amer. Ent. Soc. 73:123 (syn.: *Psilopina*). Type-species, *Typopsilopa flavitarsis* Cresson, orig. des., = *nigra* (Williston).

Psilopa, subg. *Psilopina* Becker, 1926, in Lindner, Flieg. Pal. Reg., fam. 56, p. 38. Type-species, *Ephygrobia electa* Becker, orig. des.

Small black subshining flies with hyaline, unmarked wings, pale halter knobs, and legs except portions of the tarsi blackish; macrochaetae strong.

Head moderately short and broad; breadth-height-length proportions as 3-6-8.

¹Mail address: c/o U.S. National Museum, Washington, D.C. 20560

Eyes bare. Frons short and sloping toward antennae, 0.41 as broad as head; mesofrons and orbits poorly differentiated; 1 pair of long reclinate orbitals, a proclinate seta arising slightly anterolaterad and about a third as long as orbital; inner and outer verticals long, both reclinate; a pair of long proclinate ocellars arising slightly behind level of anterior ocellus. Vertex convex but not sharply so; ocellar triangle equilateral; occiput with fine setae; cheeks setose and bearing 2-3 short bristles, the ventral one longer. Face nearly as broad as frons, slightly convex, with small foveae under the antennae; most prominent at level of the strong upper facial which is located at a third to half the distance from epistomal margin to antenna base; a second lower facial, a third to half as long as upper, and several fine setae in facial series. Epistomal margin slightly emarginate, clypeus moderately developed and exposed; palpi and proboscis normally developed. Antenna with second segment bearing a long, stout, proclinate spine at anterodorsal corner; third segment short, 1.2-1.9 times as long as broad; arista with 8-12 long dorsal rays.

Thorax moderately stout; mesonotum convex anteriorly, more flattened caudad; scutellum moderately flat; 2 pairs of notopleurals; 1 humeral; 1 presutural; 1 supra-alar; 1 intra-alar; 3 pairs of dorsocentrals, the antermost located before the suture, the posterior pair (not a true dorsocentral) more closely approximated in front of scutellum; 2 pairs of marginal scutellars; all bristles long; surface of mesonotum and scutellum subshining but coarsely scoriaceous, also bearing numerous fine, somewhat appressed setae, those in acrostichal area forming 8 irregular rows. One strong and 1 weak mesopleural bristle and 1 strong sternopleural; pleura also with fine setae. Legs moderately stout, without special modifications; forefemur in both sexes with anteroventral comb of 15-20 short, flattened denticles; femora with a few enlarged bristle-like hairs; midtibia without erect extensor bristles but a long, ventral bristle at tip; tarsi pale at base, distal segments variably darkened.

Wing with costa extending to fourth vein; second vein moderately long, costal index (length of second costal section divided by length of third) of American species 1.20-1.37; first posterior cell parallel-sided; fourth vein index (length of ultimate section divided by length of penultimate) 1.05-1.42.

Abdomen moderately long and broad, slightly convex dorsally, subshining, provided dorsally with numerous short appressed setae and a few short bristles at posterior segment margins. Sixth tergum slightly exposed usually in female, not in male.

The American species of *Typopsilopa* are readily separated into two groups on the basis of structure of the male genitalia. In the Atra Group, the ninth tergum is a narrow ribbon (though broader in *arnaudi*); the tenth sternum forms a narrow and ribbonlike genital arch mesad with the lateral ends expanded into setose lobes, which in *arnaudi* become elongated arms with a few heavy, black spines. The fifth sternum is a long setose plate with posterolateral corners expanded and lobelike, and the sixth sternum is a narrow bare plate with posterior end bifurcate. The anterior surstylus is a long slender process with slender tip bearing a few setae, arising with stouter base articulating between the anteroventral corner of the ninth tergum and the posterolateral process of the sixth sternum. On the midline

between the surstyli, the anteroventral processes of the hypandrium are appressed as slender, fingerlike hyaline blades. Species of this group have the foretarsus black and the mid and hindtarsi with tarsomeres 1-2 pale or dark, and 3-5 dark. This group has a northern distribution and has relatives and counterparts in Asia and Africa, although not in Europe.

The second group, which is exclusively Neotropical, is based on *nigra* (Williston), the type of the genus. In these species, the ninth tergum is broad, and in one species the cerci become modified. The greatest modifications in this group are found in the shape of the tenth sternum, which becomes elongated and massive, the anteroventral lobes more approximated, and in *manni*, bearing dense, heavy spines. The lobes of the tenth sternum, along with the apices of the anterior surstyli and the ventral processes of the hypandrium, lie at rest in a heavily sclerotized box formed by the greatly broadened and dorsally arched sixth sternum, for which the fifth sternum forms a ventral setose margin. Species of the Nigra Group have tarsomeres 1-4 pale on all legs with only the fifth dark.

Typopsilopa occupies an anomalous position, sharing characters which otherwise distinguish the subfamilies Psilopinae and Notiophilinae. For many years, it was thought to be related to *Psilopa* Fallén because of the close superficial resemblance in body form and color and most features of chaetotaxy. Cresson (1916), when he erected the genus *Typopsilopa*, compared it only with *Psilopa* and *Clasiopella* Hendel, pointing out that the generic importance of the presence or absence of the two true dorsocentrals may be questioned. It was not until 1946 that the true relationships of the genus were recognized when Cresson placed it in a new tribe of Notiophilinae, the Typopsilopini, giving the following tribal characters:

"Eyes bare; lunule not developed; ocellars approximate, and strong, aligned with or caudad of line of anterior ocellus; antennal spine strong; dorsocentrals arranged 1: 1 or 0: 1; posterior notopleural not removed dorsad; mid tibiae without erect extensors; costa extending to vein IV."

KEY TO THE AMERICAN SPECIES OF *Typopsilopa*

(See also Table 1)

1. Tarsi dark brown, at least on forelegs; face flatter in middle; sternum VI of male (figs. 1, 8) narrow and ribbonlike, usually not much more than half as wide as distance across lobes of sternum X, not markedly concave 2
- Tarsi pale at least in part on all legs; face more tumid in middle; sternum VI of male (fig. 13) broader than distance across lobes of sternum X, heavily sclerotized and forming a broad concavity into which the genital processes can be thrust anterodorsally 4
2. Lobes of sternum X (figs. 10, 12) greatly elongated arms nearly as long as the transverse basal bridge of sternum, and each bearing distally 4 long, stout, black spines; all tarsi black **arnaudi**, n. sp.

- Lobes of sternum X (figs. 2, 5) low and flaplike and bearing distally only fine hairs or a few bristles; at least mid and hindtarsi slightly yellowish 3
3. Sternum VI (fig. 1) of male with the bifurcate posterior portion broader than the anterior end; lobes of sternum X (fig. 2) rounded with numerous fine hairs; surstyli (fig. 3) slender and rodlike distally; third antennal segment long, 1.9 times as long as greatest breadth **antennalis**, n. sp.
Sternum VI (fig. 9) of male with the bifurcate posterior portion narrower than the anterior end; lobes of sternum X angulate (fig. 5) with a few stouter bristles; surstyli (figs. 6, 11) stouter and more fingerlike distally; third antennal segment short, 1.5 times as long as basal breadth **atra** (Loew)
4. Male cerci (fig. 18) produced on anteroventral ends in form of a pointed, blackish, strongly sclerotized spine; sternum X with ventromesal margin between the lateral lobes slightly concave; foreleg with only tarsomere 1 yellowish **archboldi**, n. sp.
Male cerci (fig. 14) normal, anteroventral ends not spinelike; sternum X with deeply emarginate anteroventral margin; foretarsi variously darkened 5
5. Sternum X (fig. 13) with lateral lobes widely separated, low and angular, not as long as the distance between their distal points; foreleg with tarsomeres 1-4 bright yellow **nigra** (Williston)
Sternum X (figs. 15, 17) with lateral lobes much longer and broader than the mesal emargination between them; foreleg with only tarsomere 1 yellowish 6
6. Lobes of sternum X (fig. 15) with fine bristles only **inea**, n. sp.
Lobes of sternum X (fig. 17) covered distally with curved stout black spines **manni**, n. sp.

Typopsilopa atra (Loew)

(Figs. 5-9, 11)

Psilopa atra Loew, 1862, Monogr. N. Amer. Dipt. 1:143 (male; Middle States).

Typopsilopa atra (Loew); Cresson, 1916, Ent. News 27:147 (comb.).—Cresson, 1946, Trans. Amer. Ent. Soc. 72:240 (dist.: Mass. to Oreg., s. to Fla., Utah and Calif.).—Wirth, 1965, in Stone, et al., Cat. N. Amer. Dipt. p. 743 (syn.: *scoriacea* Loew).

Psilopa scoriacea Loew, 1862, Monogr. N. Amer. Dipt. 1:142 (female; N.Y.).

Male, Female.—Wing 2.25 mm. long by 0.88 mm. broad. Shining black; mesonotum and scutellum scoriaceous, with sparse coarse brown pollen; face with slight whitish dusting, especially on sides; antenna and palpus entirely black; tarsus brownish black on foreleg, tarsomeres 1 and 2 yellowish on mid and hind-legs; wings grayish hyaline, the veins yellowish; halter knob creamy white, stem dark. Antenna with third segment short, 1.5 times as long as greatest breadth; arista with 9 rays. Strong upper facial located about a third way from epistomal margin to antenna base; face nearly flat, only slightly convex. Wing with costal index 1.39; fourth vein index; hind crossvein 1.06 times as long as breadth of first posterior cell at same level.

Male genitalia as in fig. 11. Sternum V (fig. 8) nearly twice as long as posterior breadth, with uniform sparse setose hairs on surface. Sternum VI

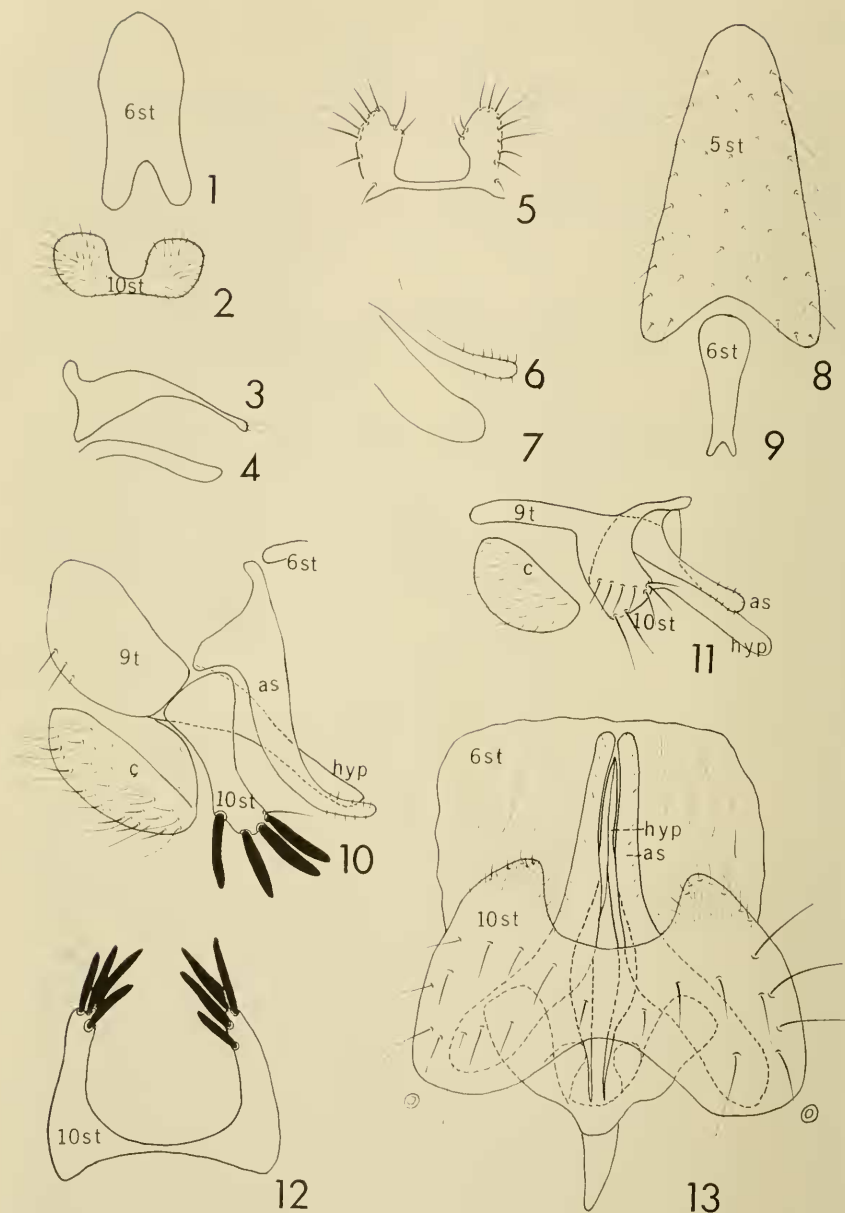
Table 1. Quantitative Characters of *Typopsilopa* species.

	Arista Rays	Antenna III (L/W)	Tarso- meres Leg I brown	Tarso- meres Legs II, III brown	Wing Length (mm.)	Costal Index	Fourth Vein Index
Atra Group							
<i>atra</i> (Loew)	9	1.5	1-5	3-5	2.25	1.30	1.39
<i>antennalis</i> n. sp.	8	1.9	1-5	3-5	2.12	1.20	1.42
<i>arnaudi</i> n. sp.	9	1.5	1-5	1-5	2.13	1.32	1.27
Nigra Group							
<i>nigra</i> (Will.)	10	1.2	5	5	2.86	1.37	1.05
<i>archboldi</i> n. sp.	8	1.7	2-5	5	2.56	1.26	1.08
<i>manni</i> n. sp.	10	1.7	2-5	5	2.56	1.22	1.28
<i>inca</i> sp.	12	1.9	2-5	5	2.62	1.25	1.17

(fig 9) a small, elongated, narrow sclerite without hairs or setae; anterior end broader and rounded, the ventral surface slightly concave, spoonlike, and tucked dorsally under the posterior end of sternum V; posterior end bifurcate with a pair of small lobes. Sternum X (fig. 5) with very slender mesal bridge, the lateral ends expanded in a pair of angulate lobes bearing a few stout, long, bristly hairs. Surstyli and (figs. 6, 11) processes of hypandrium (figs. 7, 11) each produced in a moderately slender fingerlike process, the former with 8-10 very fine distal setae; slender and straight in western specimens, and slightly curved in eastern individuals.

Distribution.—North America from California to Ontario and New York, south to Georgia and Central America.

Specimens Examined.—182 specimens, as follows: ARIZONA: Catalina Mts. (Wehrle); Wickenburg, Hassayampa R. (Wirth). ARKANSAS: Washington Co. (Rouse). CALIFORNIA: Capistrano Hot Spr. (Melander); Centerville, Fresno Co. (Yost); Lemoore, Kings Co. (Hall); Live Oak Park (Melander); Panamint Springs, Inyo Co. (Howden); Riverside (Melander); San Juan Hot Spr. (Melander); Temecula (Melander); Sentenac Canyon, San Diego Co. (Bechtel); Victorville (Richards); Whitewater Fish Hatchery, Riverside Co. (Arnaud). COSTA RICA: La Caja, 8 km. w. San Jose (Schmidt). DISTRICT OF COLUMBIA: Chain Bridge (McAtee). GEORGIA: Billy's Id., Okefenokee Swamp; Tifton (Bradley); Valdosta (Young). GUATEMALA: Ingenio Railroad Sta. (Aldrich). ILLINOIS: Algonquin; Champaign Co. (Shackleford); Chicago (Melander); Dubois (Malloch); Glen Ellyn (Melander); Meredosia (Malloch); Muncie (Malloch); Pistakee Bay (Melander); River Forest (Melander). INDIANA: Dune Park (Melander); Lafayette (Aldrich); Michigan City (Aldrich). IOWA: Ames. KANSAS: Lawrence (Sanderson); Manhattan (Sabrosky). KENTUCKY: Lexington (Aldrich). MARYLAND: Chesapeake Beach (Aldrich, Malloch). MASSACHUSETTS: Woods Hole (Melander). MEXICO: El Salto, Durango, 9000 ft. (McAlpine); Mt. Colima, pine zone, se. slope (Leech, Ross); Sierra



Figs. 1-4, *Typopsilopa antennalis*, n. sp., ♂ genitalia: 1, sternum VI, ventral view; 2, sternum X, ventral view; 3, surstylus, lateral view; 4, process of hypandrium, lateral view. Figs. 5-9, 11, *T. atra* (Loew), ♂ genitalia: 5, sternum X, ventral view; 6 and 7, apices of surstylus and process of hypandrium, respectively, New York specimen, lateral view; 8, sternum V, ventral view; 9, sternum VI,

Laguna, Big Canyon, Baja Calif. (Ross & Bohart); Tijuana, 60 km. s. (Melander). MICHIGAN: Detroit (Steyskal); Midland Co. (Dreisbach); Nottawa (Sabrosky). MISSOURI: Atherton (Adams); Columbia (Crosby). NEW JERSEY: Trenton. NEW YORK: Allegany St. Park (Wirth); Bergen (Beamer); Niagara (Melander); Sinclairville (Wirth). NORTH CAROLINA: Andrews Bald, Gr. Smokies (Melander); Highlands (Richards). OHIO: Wauscon. ONTARIO: Grand Bend (Shewell); Pt. Ryerse (Shewell). TEXAS: Austin (Melander); Brownsville (Hardy); Hunt, Guadalupe R. (Wirth); Kerrville, Henke Pond (Wirth); Dallas (Jones); Brownwood (Painter); Cibola R., Sutherland Spgs. (Nabours & Sabrosky); Liberty (Tucker); San Antonio (Melander); Uvalde, Garner State Park (Wirth). UTAH: St. George (Knowlton & Smith); Spanish Fort (Corbett). VIRGINIA: Alexandria (Aldrich); Fairy Stone St. Park (Vockeroth). WISCONSIN: Devils Lake (Melander).

***Typopsilopa antennalis* Wirth, n. sp.**

(Figs. 1-4)

Male.—Indistinguishable externally from *atra* (Loew) except for length of third antennal segment which is 1.86 times as long as greatest breadth. Costal index 1.20; fourth vein index 1.42; hind crossvein 1.72 times as long as breadth of first posterior cell at same level. Wing 2.12 mm. long by 0.85 mm. broad.

Genitalia as in figs. 1-4. Sternum X (fig. 2) with the lateral lobes bearing fine setose hairs only, no strong bristles, the lobes placed closer together with a broader mesal bridge than in *atra*; sternum VI (fig. 1) with posterior bifurcate portion at least as broad as the anterior half; surstylus (fig. 3) with distal end very slender, bearing 2-3 fine hairs as extreme tip; process of hypandrium (fig. 4) a slender fingerlike blade.

Female.—Not distinguished with certainty from *atra* in the series recorded.

Distribution.—Florida, Georgia, South Carolina.

Types.—Holotype male, Ridgeland, South Carolina, 24 March 1954, A. Stone (USNM 69525). Paratypes, 8 males: FLORIDA: Royal Palm St. Park, 27 January 1939, A. L. Melander, 1 male. GEORGIA: Tifton, 8 June 1896, 3 males. SOUTH CAROLINA: Manning, 29-30 May 1914, W. Stone, 4 males (ANSP, USNM).

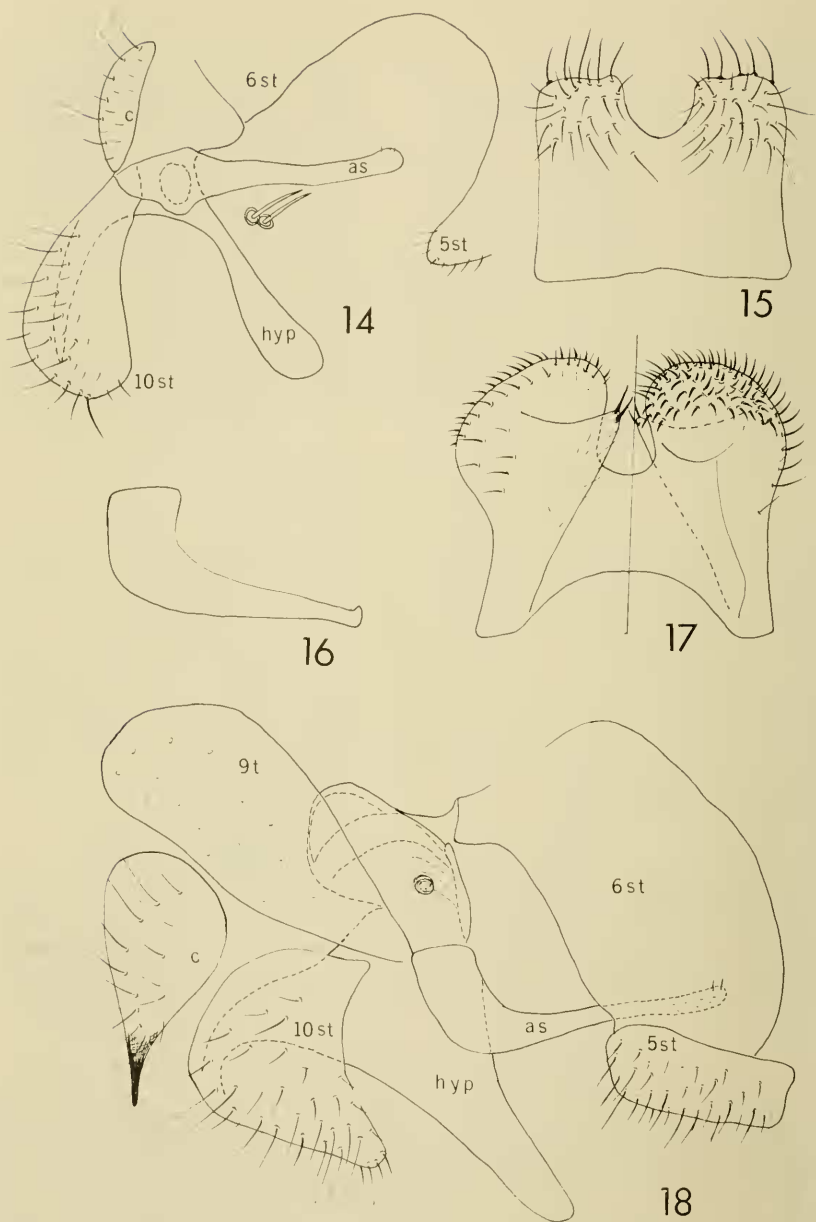
***Typopsilopa arnaudi* Wirth, n. sp.**

(Figs. 10, 12)

Male, female.—as in *atra* (Loew) except as follows: Face slightly more carinate and not quite so dull; tarsomeres 1-5 saturate black on all legs; costal index 1.32; fourth vein index 1.27; wing 2.13 mm. long by 0.80 mm. broad.

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ventral view; 11, genitalia of Arizona specimen, lateral view. Figs. 10, 12, *T. arnaudi*, n. sp.: 10, ♂ genitalia, lateral view; 12, sternum X, ventral view. Fig. 13, *T. nigra*, n. sp., ♂ genitalia, ventral view. Abbreviations: as, anterior surstylus; c, cercus; hyp, hypandrium; st, sternum; t, tergum.



Figs. 14, 15, *Typopsilopa inca*, n. sp.; 14, ♂ genitalia, lateral view; 15, sternum X, ventral view. Figs. 16, 17, *T. manni*, n. sp., ♂ genitalia: 16, surstylus, lateral view; 17, sternum X, ventral view. Fig. 18, *T. archboldi*, n. sp., ♂ genitalia, lateral view. Abbreviations: as, anterior surstylus; c, cercus; hyp, hypandrium; st, sternum; t, tergum.

Male genitalia as in fig. 10. Sternum X (fig. 12) with very slender mesal bridge, the lateral lobes each greatly produced ventrocephalad in a long arm bearing 4 long, black, stout, blunt spines. Sterna V and VI similar to those of *atra*, VI with slender bifurcate posterior end; surstyli slender and curved gradually to fingerlike tip bearing a few minute subapical setae; processes of hypandrium long slender blades.

Distribution.—California and Oregon to Idaho, Utah, New Mexico, and Mexico.

Types.—Holotype male, allotype female, Deep Creek, California, 25 October 1953, A. L. Melander (USNM 69526). Paratypes, 64 males, 91 females: ARIZONA: Granite Delta, 30 May 1935, P. W. Oman, 1 male; Indian Pine, 28 August 1964, M. E. Irwin, 1 male; Montezuma Wells Nat. Mon., 30 June 1953, W. W. Wirth, 3 females; Patagonia, 24 June 1933, P. W. Oman, 1 female; same, 27 June 1953, W. W. Wirth, 1 male; Portal, S. W. Res. Sta., 26 September 1964, 1 June 1965, V. D. Roth, 2 males (Riverside); Sunnyside Canyon, Huachuca Mts., 11 July 1940, D. G. Hall, 1 female (ANSP); same, 9 July 1940, D. E. Hardy, 1 male (KANS). CALIFORNIA: Aguanga, 4 mi. w. Riverside, 24 April 1951, E. I. Schlinger, 1 female (Davis); Alamos Creek, San Luis Obispo Co., 22 June 1948, W. W. Wirth, 1 male, 1 female; Alpine Lake, 14 August 1957, A. L. Melander, 1 female; Barton Flats, August 1942, September 1950, 23 August 1952, A. L. Melander, 2 males, 3 females; Big Meadows, 30 July 1937, G. Spurlock, 2 females; Centerville, Fresno Co., 7 June 1965, P. Yost, 1 female (Riverside); Cisco, 5 June 1940; M. & H. James, 1 male, 1 female; Colfax, 20 May 1952, E. I. Schlinger (Davis); Crestline, 4 July 1942, A. L. Melander, 1 female; Deep Spring, Inyo Co., 16 July 1953, E. I. Schlinger, 3 males, 1 female (Davis); Dutch Flat, Placer Co., 20 May 1952, E. I. Schlinger, 1 female (Davis); Fallen Leaf, Eldorado Co., 6500 ft., 13 July 1961, J. G. Chillcott, 1 female (CAN); Glen Alpine, Lake Tahoe, 1 September 1930, H. H. Keifer, 1 female; Green Valley, 26 July 1944, A. L. Melander, 1 male, 4 females; Idyllwild, 7 June 1942, A. L. Melander, 1 male; Jenks Lake, 14 July, 24 August 1950, A. L. Melander, 3 females; Jacumba Springs, 28 June 1917, J. M. Aldrich, 4 females; Julian, 5 May 1945, A. L. Melander, 1 female; Kaweah River, Tulare Co., 12 October 1947, R. Coleman, 1 male; Keen Camp, 7 June 1942, A. L. Melander, 1 male, 3 females; Lake Tahoe, 11 August 1940, L. J. Lipovsky & D. E. Hardy, 2 males; Onyx, 7 mi. e., Kern Co., 12 June 1961, H. F. Howden, 1 female (CAN); Ortega Hwy., Mariana River, 19 October 1944, A. L. Melander, 1 female; Pacific, 9 August 1940, D. E. Hardy, 1 male, 1 female; Palm Springs, 19 November 1943, 4 October 1946, A. L. Melander, 2 males, 2 females; Pinecrest, Tuolumne Co., 13 August 1948, P. H. Arnaud, 1 male, 1 female; Riverton, 19 August 1953, E. I. Schlinger, 1 female (Davis); Siskiyou Co., 19 July 1948, W. W. Wirth, 1 male (CAS); Sardine

Creek, Mono Co., 6 July 1951, A. T. McClay, 2 females (Davis); Strawberry, Tuolumne Co., 20 July 1951, A. T. McClay, 1 male, 2 females; (Davis), Thorn, Mohave Desert, 30 May 1944; A. L. Melander, 1 male; Trinity River Camp, Trinity Co., 17 July 1953, A. T. McClay, 3 males (Davis); Tuolumne Meadows, 1 July 1940, D. E. Hardy, 1 male; Valyermo, 13 May 1934, A. L. Melander, 1 male, 4 females; Victorville, 12 May 1955, W. R. Richards & W. R. Mason, 2 males, 9 females (CAN); Whitewater Fish Hatchery, Riverside Co., 6 January 1953, P. H. Arnaud, 1 male, 2 females; Willets, 19 June 1935, A. L. Melander, 1 male; Yosemite Nat. Park, 1 August 1940, L. J. Lipovsky, 1 male, 27 June 1947, A. L. Melander, 1 female; Yuba Pass, Sierra Co., 20 August 1953, E. I. Schlinger, 1 male, 1 female (Davis). IDAHO: Caldwell, 2372 ft., 9 July 1926, C. Wakeland, 1 male (ANSP). MEXICO: Baja California, Sierra San Pedro Martir, La Grulla, 6900 ft., 12-15 June 1953, P. H. Arnaud, 14 males, 12 females; Rancho Viejo, 7000 ft., 13 June 1953, P. H. Arnaud, 3 females (CAS); Trail La Joya to La Zanja, 10 June 1953, P. H. Arnaud, 1 male, 1 female (CAS); El Salto, 9000 ft., 10 mi. w. Durango, 10 June 1964, J. F. McAlpine, 1 male, 3 females (CAN); same, 7 May 1961, Howden and Martin, 1 female (CAN). NEVADA: Beatty, 26 May 1940, G. E. Bohart, 1 female (CAS); Carson City, 25 May 1952, E. I. Schlinger, 1 female (Davis); Crystal Springs, Lincoln Co., 21 June 1953, A. B. Gurney, 1 male, 2 females; Reno, 20 October 1915, H. G. Dyar, 1 male. NEW MEXICO: Belen, 1 July 1947, L. D. Beamer, 1 male; Jemez Springs, June, September 1914, 2 males, 4 females (ANSP); Socorro, 1916 Williston Coll., 1 female; Rio Grande River, Taos Co., 6 July 1953, W. W. Wirth, 1 male. OREGON: Kerby, 18 September 1934, A. L. Melander, 2 males, 3 females (ANSP, USNM). UTAH: Kanab, 19 April 1935, A. L. Melander, 1 male.

This species is named in honor of Dr. Paul H. Arnaud, Jr., of the California Academy of Sciences in recognition of his extensive contributions to the dipterology of western North America. It is readily distinguished from the other North American species by the saturate black tarsi and the heavy black spines on the male tenth sternum.

***Typopsilopa nigra* (Williston), n. comb.**

(Fig. 13)

Psilopa nigra Williston, 1896, Trans. Ent. Soc. London 1896:139, pl. 13, fig. 139 (female; St. Vincent I.; fig. head).

Typopsilopa flavitarsis Cresson, 1916, Ent. News 27:147 (Ariz.).—Cresson, 1946, Trans. Amer. Ent. Soc. 72:240 (dist.: Neotropical, Fla., Ga., La., and Ariz.).—Wirth, 1956, Amer. Mus. Novitates no. 1817, p. 17 (Bahamas). New synonymy.

Male, female.—Shining black; mesonotum and scutellum scoriaceous; tarsi bright yellow except tarsomere 5 brownish; wing grayish hyaline; halter knob white; frons and face less shining than in *atra*; opaque frontalia less differentiated; face

more or less irregularly wrinkled. Face longer than in *atra*, more tumid in middle, the long upper facials higher, about midway between epistomal margin and antenna. Antenna short, third segment only 1.2 times as long as greatest breadth; arista with 10 rays. Legs stouter than in *atra*, femora particularly stout; hairs on abdominal terga rather strong and dense. Second vein longer than in *atra*, costal index 1.37; fourth vein index 1.05. Wing 2.86 mm. long by 1.10 mm. broad.

Male genitalia as in fig. 13. Sternum VI heavily sclerotized and broad with distinct longitudinal wrinkles forming a boxlike ventral concavity within which the tenth sternum, surstyli, and processes of the hypandrium lie in repose. Sternum X large, slightly more than twice as broad as greatest length, the anteroventral margin with a broad rounded excavation mesad, the anterior margin on each side forming a broad, angulate lobe provided with fine, somewhat twisted hairs. Cerci normal, flaplike, setose. Surstyli gradually tapered to slender, bladelike processes, each with a row of minute setulae on ventral side; anteroventral processes of hypandrium slender blades lying between the surstyli on midline.

Distribution.—Arizona to Georgia, south to Brazil.

Types.—*Psilopa nigra*: 2 syntypes, St. Vincent I. (one is in the British Museum (Nat. Hist.), London and is here designated lectotype). *Typopsilopa flavitarsis*: holotype male, Bill Williams Fork, Arizona, F. H. Snow (KANS); also 3 male paratypes, same data.

Specimens Examined.—74 specimens, as follows: ARIZONA: Bill Williams Fork (Snow), holotype and 1 male paratype; Standfield (Butler). BAHAMAS: Andros I., Mangrove Cay (Hayden); Eleuthera I., New Portsmouth (Hayden and Giovannoli); Long I., Deadman's Cay (Hayden); San Salvador I., near Cockburn Town (Hayden). BRAZIL: Amazon River near Obidos (Holt, Blake, and Agostini); Gavea, Rio de Janeiro (Sousa Lopez). BRITISH GUIANA: Georgetown Bot. Gard. Exp. Sta. (Squire), bred from rice stool. CALIFORNIA: Needles (Kusche). COSTA RICA: Peralta (Calvert). DOMINICA: Cabrit Swamp (Wirth). DOMINICAN REPUBLIC: Samana (Sanchez). FLORIDA: Alachua Co. (Weems); Ft. Lauderdale (Melander); Hendry Co. (Morse); Little River (Knab); Miami (Knab). GEORGIA: Tifton. LOUISIANA: New Orleans (Plank); Slidell. MEXICO: La Bolsa (McGovran). NICARAGUA: Potosi (Woke). PANAMA: Ancon, C. Z. (Greene); Taboga I. (Busck). PUERTO RICO: Mayaguez. VIRGINIA: Warsaw, Richmond Co. (Wirth).

Discussion.—I examined the female syntype of *Psilopa nigra* Williston in the British Museum (Nat. Hist.) in 1957 and found that it was a *Typopsilopa*; at that time, a critical comparison with *flavitarsis* was not made. Characters given by Williston in the original description of *nigra* which agree well with *flavitarsis*: shape of face and antenna; position of the facials midway between epistomal margin and antenna; arista with 10–12 rays; legs black, all the tarsi yellow, with the distal joints blackish; second section of the costal vein about one-third longer than the third section; ultimate section of the

fourth vein only a little longer than the penultimate section; length 3 mm. These characters fit *flavitaris* much better than *archboldi*, n. sp., the only other *Typopsilopa* species whose known distribution would bring it into consideration as Williston's species.

***Typopsilopa archboldi* Wirth, n. sp.**

(Fig. 18)

Male, female.—Similar to *nigra* (Williston) but differing as follows: Foretarsus with only tarsomere 1 yellowish, 2–5 dark brown; face more tumid in middle; third antennal segment longer, 1.7 times as long as greatest breadth; arista with 8 rays; costal index 1.26; fourth vein index 1.08. Wing 2.56 mm. long, 0.96 mm. broad.

Male genitalia as in fig. 18. Sternum V short and bristly; sternum VI a massive, well sclerotized box-like concavity without longitudinal wrinkling; sternum X with narrow mesal bridge, anterior margin with low rounded bristly lateral lobes, the mesal excavation very gently rounded. Cerci large, each greatly prolonged ventrally in a heavily sclerotized, sharp spinelike point extending over mesal excavation of sternum X. Surstyli greatly bent near base in lateral view, distal portion slender and nearly straight, bearing 2 fine, distal setae and a few subapical hyaline spicules. Anteroventral process of hypandrium very stout, not divided, forming a subconical ventral protuberance.

Distribution.—Dominica, Puerto Rico.

Types.—Holotype male, allotype female, Cabrit Swamp, Dominica, 22–25 March 1965, W. W. Wirth, Bredin-Archbold-Smithsonian Biological Survey of Dominica (USNM 69527). Paratypes, 9 males, 9 females: DOMINICA: 7 males, 7 females, same data as types. PUERTO RICO: San German, 23 Dec. 1962, P. & P. Spangler, 2 males, 2 females.

This species is dedicated to Mr. John Archbold, in appreciation of his support of the Biological Survey of Dominica and his keen interest in the scientific exploration of the island.

***Typopsilopa manni* Wirth, n. sp.**

(Figs. 16, 17)

Male, female.—Similar to *nigra* (Williston) but differing as follows: third antennal segment longer, 1.7 times as long as greatest breadth; foretarsi darker, tarsomeres 2–5 brownish; costal index 1.22; fourth vein index 1.28. Wing 2.56 mm. long, 0.95 mm. broad.

Male genitalia as in figs. 16, 17. Sternum V short, broad posteriorly, surface with short setose hairs; sternum VI heavily sclerotized, concaved ventrally forming a ventral pouch for the genital processes, narrowed posteriorly. Sternum X (fig. 17) greatly elongated, the bulbous lateral lobes as long as basal breadth of sternum, with a narrow, deep mesal cleft between the lobes nearly halfway to base of sternum; apices of lobes densely covered with short stout sharp spines on posteroventral side; anterodorsally each lobe drawn out in a finely setose flap ending in a distal point provided with 2 stout spines, this point not nearly as long as the rounded lobes. Cerci normal; flaplike. Surstyli (fig. 16) abruptly

bent near base, rather stout proximally, gradually narrowed to slender tip with small lateral point; anteroventral processes of hypandrium an appressed pair of slender pointed blades.

Distribution.—Bolivia; Argentina, Paraguay.

Types.—Holotype male, Rosario, Bolivia, Rio Rocagua, No. 1921, W. M. Mann, Mulford Biol. Exped. (USNM 69528). Allotype female, Argentina, Formosa, Mission Laishi, 13–15 Dec. 1948. Paratypes, 3 males: PARAGUAY: Incarnacion, 16 Jan. 1927, F. & M. Edwards, 1 male. San Bernardino, 1908, Fiebrig, 1 male (ANSP); same, Babarczy coll., 1 male.

This species is dedicated to Dr. William M. Mann in tribute to his early interest in entomology and his worldwide eminence as a zoologist.

***Typopsilopa inca* Wirth, n. sp.**

(Figs. 14, 15)

Male, female.—Similar to *nigra* (Williston) but differing as follows: Third antennal segment long, 1.9 times as long as greatest breadth; arista with 12 rays; foretarsi darker, tarsomeres 2–5 brownish; costal index 1.25; fourth vein index 1.17. Wing 2.62 mm. long, 1.06 mm. broad.

Male genitalia as in fig. 14. Sternum V slightly longer than posterior breadth, surface with short setose hairs; sternum VI heavily sclerotized, concaved ventrally forming a ventral pouch for the genital processes. Sternum X (fig. 15) long and broad, quadrate in outline with a narrow anteromedian cleft extending to about a third of total length, the lateral lobes with broad truncate apical margins and bearing long bristly hairs on posteroventral and distal surfaces. Cerci normal. Surstyli slightly curved, tapering to slender tip bearing subapically 2–3 minute setae; anteroventral processes of hypandrium an appressed pair of hyaline blades slightly expanded distally in lateral profile.

Distribution.—Ecuador, Peru.

Types.—Holotype male, allotype female, Canete Peru, 17 May 1941, P. A. Berry (USNM 69529). Paratypes, 7 males, 7 females: ECUADOR: Loya, Catamayo, 1500 meters, 24 March 1965, L. Pena (CAN). PERU: 6 males, 6 females, same data as types; Loreto, Yarinacocha, 9–18 April 1963, L. Pena, 1 female (CAN).

This species is near *manni* n. sp. but differs markedly in the bristly instead of spinose armature of the more truncate lobes of the tenth sternum. The tenth sternum is more like that of *nigra* (Williston), but the lateral lobes are more truncate and the surstyli are slenderer, whereas *nigra* also differs in its pale tarsomeres 1–4 on the foreleg.

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